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ABSTRACT

This guide is the first of three documents that make up a Professional Development Package for Educational Systems Design. Together, the documents constitute an integrated package designed to help educators and others accomplish specific purposes relative to a communitywide systems design effort. The orientation guide is ideally used in a 1-day study and discussion session for educational and community leadership and is designed to provide a basic understanding of educational systems design. It provides an overview of the process as it might take place within a school district and community and is also intended to convince orientation session participants of the importance of educational design as the needed strategy for reform. The listed purposes of the orientation session are as follows: (1) to explore the implications for education of the rapidly changing societal environment and advances in knowledge about learning and human development; (2) to develop among educational stakeholders an appreciation of the power of design for creating more appropriate systems of learning and human development; and (3) to help stakeholders to explore and reflect upon their responsibilities and the specific contributions they can make to the redesign of education. (MLF)

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THE TRANSFORMATION OF EDUCATION BY DESIGN:

An Orientation Guide for Educational Decision Makers

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THE TRANSFORMATION OF EDUCATION BY DESIGN

An Orientation Guide
for
Educational Decision Makers

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THE TRANSFORMATION OF EDUCATION: BY DESIGN

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PREFACE

This guide is the first of three documents that make up a Professional Development Package for Educational Systems Design. Together, the documents constitute an integrated package designed to help the intended audiences (educators and others) accomplish specific purposes relative to a communitywide systems design effort. Some overlap in audiences is expected since everyone involved in the educational design effort will have read the orientation guide as a first activity. The three documents are described below.

1. THE TRANSFORMATION OF EDUCATION: BY DESIGN: An Orientation Guide for Educational Decision Makers

Audience: Policy makers, community leaders, public and private sector leadership, school board members, professional educators in public and higher education, parents, students, and others concerned with education and human development.

Purposes:

- To explore the implications for education of the rapidly changing societal environment and advances in knowledge about learning and human development

- To develop among educational stakeholders an appreciation of the power of design for creating more appropriate systems of learning and human development

- To help stakeholders to explore and reflect upon their responsibilities for — and the specific contributions they can make to — the redesign of education

How Used: The orientation guide is ideally used in a one-day study and discussion session for educational and community leadership. Participants should have read the manual prior to the session.

How Organized: The guide is designed to provide readers with a basic understanding of educational systems design. It provides an overview of the process as it might take place within a school district and community. It is also intended to convince readers and orientation session participants of the importance of educational design as the needed strategy for reform.

2. THE TRANSFORMATION OF EDUCATION BY DESIGN: A Leadership Guide for Educational Decision Makers

Audience: A leadership group empowered to provide leadership, policy direction, and support for a design effort. This group may be organized by (or consist of) the educational leadership in a community in cooperation with the school board and other key community leaders.

Purposes:

- To develop further knowledge about the process and requirements for educational design
- To develop awareness and appreciation of the roles and organizational capabilities and capacities necessary for a design process
- To assist the leadership to explore the various dimensions and options for shaping a design inquiry process and for establishing general parameters for the designers

How Used: This guide is to be used in a three-day workshop for a leadership group. Participants will extend their knowledge and understanding of design by exploring and developing plans for their own leadership roles for guiding, providing support, and mobilizing the community in an educational systems design effort.

How Organized: The guide is organized around key concepts and requirements that leadership must address to initiate and sustain an effective design inquiry process.

3. TRANSFORMATION OF EDUCATION BY DESIGN: A Trainer's Guide for Educational Systems Designers

Audience: This guide is intended for the core design team. The team is established by the leadership group and is responsible for conducting the design effort. Members of this team will be, for the most part, educators and others who will have responsibility for the eventual implementation of the new design. They are user-designers.

Purposes:

- To develop needed capability (knowledge and skills) of designers to engage in a design process

- To assist designers to develop a detailed plan that specifies the steps, tasks, needed resources, arrangements, etc., necessary to conduct a systems design effort in the school district and community

How Used: The most effective use of the guide will be with intact teams of persons from communities who have been designated as members of the core design team and who are able to meet with one or more trainers. Participants address design questions and issues in the context of their own work environment. Teams will participate in a five-day intensive training workshop aimed at developing the readiness to initiate their own design effort.

How Organized: This guide is organized around the full set of design process tasks and activities. It gives minimal information about design, focusing instead on learning and application exercises, tasks, implementation guidelines, and additional resources for the conceptual content concerning design (for example, *Systems Design of Education: A Journey to Create the Future* by Bela H. Banathy, Educational Technology Publications, In Press).

INTRODUCTION

This orientation guide is for those members of the educational community who have begun to question the adequacy of our present system and the wisdom of our current Band-Aid response to school management and who are willing to think about very different educational systems. The guide introduces a new approach to educational reform: **systems design**. By helping us view education with fresh eyes, the systems design process enables us to create new systems of learning that will provide the kinds of environments and experiences needed by learners in our rapidly changing world.

In the following pages, we will ask you to explore the educational implications of our changing society; develop a general understanding of the power of systems design for creating more appropriate systems of learning and human development; assess the potential benefits of the systems design process for your community; learn about the requirements for systems design in terms of activities, time, and other resources; and think about the responsibilities of educators, the school district, and community members for directing educational change and making contributions that will ensure success in the process of developing new systems of education.

> You see things as they are and ask, Why?
> But I dream things that never were and ask, Why not?
>
> — George Bernard Shaw

We have yet to envision an image of education that will lead us confidently into the 1990s and beyond. Over the past three decades we have invested tremendous energy and resources into exploring ways to "fix" an educational system that is now seriously outdated and disconnected from the larger society with which it must interact.

An educational system reflects the beliefs, values, and aspirations of the society. These are expressed in the educational purposes and policies that define the educational experiences the system provides. In turn, societal beliefs and values are reinforced and shaped by the educational experiences of its members. To function well and to successfully address the needs and aspirations of our communities and our learners, education and society must maintain a coevolutionary relationship in which each responds to and influences the other.

Today, however, there is a serious mismatch between the educational system and the needs of communities and learners. This mismatch creates a gap which is increasing as societal changes (for example, population and socio-economic shifts) and technological advances raise issues that are beyond the capacity of the schools to address. Schools are often expected not only to prepare students for participation in our changing technological society and to deal with tremendous amounts of new information, but to

address societal problems that blur the lines of responsibility between the school, the family, and society. This mismatch is the basic source of the current "crisis" in education.

Since the early 1960s, dozens of national reports have contributed to our awareness of this educational crisis, and a range of school improvement strategies and reform policies have been proposed. But few of these reports recognize the gap between educational and societal systems.

As a rule, most improvement efforts have focused only on the school setting. They fail to address the essential fact that education is a system functioning within a changing societal system. At best, they give some attention to social problems that cross over into the schools, for example, drug use, teen pregnancies, and students at risk. To view schools as operating in isolation from the larger society no longer makes sense. The codependence between the society and education must be acknowledged. Otherwise, their coevolutionary relationship potential remains unrealized and neither can play the roles that would keep each system moving on track in terms of its responsibilities to people and their aspirations and goals for the future.

Just as educational and societal systems have been considered separately, there has been a tendency to view issues and problems within the educational system as separate from each other rather than as parts in a system in which each piece functions in relation to the others. Most reforms have been aimed at individual components of the system, for example, curriculum, teaching practices, class scheduling, staff development, or counseling programs. But problems in one part of the system impinge on other parts of the system. As long as changes are attempted without considering the entire system of interconnected parts, they will be piecemeal and limited and they may not support the overall functioning of the educational system and its contributions to society.

Clearly, our educational system is too far out of balance with the needs and realities of modern society, its learners, and their communities for simple problem solving. That is why we are proposing a comprehensive approach for making systemic changes in education, one that considers how education functions as a system of interacting parts and as a system in relationship to other systems — families, public and private agencies, the community, and the larger society.

Our challenge is to understand the characteristics of our vastly changing society, to grasp the educational implications of those characteristics, and to create a vision and image that will guide the transformation of education.

In the following pages we will suggest (1) a major shift in our perceptions; (2) the asking of new questions; and (3) a new strategy for transforming education. We call this new strategy the **Transformation of Education by Design.**

I. SYSTEMS DESIGN: THE NEEDED RESPONSE

> Intentions are fairly easy to perceive, but frequently do not come about and are not fulfilled. Design is hard to perceive. But it is design and not intention that creates the future.
>
> — Kenneth Boulding

The current crisis in education is first and foremost a crisis in perception. It calls for new ways of perceiving change and a new strategy for educational inquiry.

Most efforts toward change in education begin by analyzing our existing educational systems and asking such questions as:

- What is wrong with the system?
- How can we improve it or restructure it to make it more efficient and cost effective?
- How can we provide more instructional time?
- How can we improve student and teacher performance?
- How can we increase achievements in basic science, in critical thinking, etc.?
- How can we obtain more parent and community involvement?

Such questions might be appropriate if adjustments alone were enough to keep an existing system in step with changes in the larger environment and with its learners' needs. But in time of major societal transformation and accelerating change we should ask questions very different from those we have asked in the course of the last decade. Maintenance of the existing educational system is not enough today.

Accordingly, the systems design process begins by exploring the overall societal context in which education operates in order to define the societal function of education. Systems designers ask such questions as:

- What is the nature and what are the characteristics of the current post-industrial information age?
- What are the educational implications of these characteristics?

- What should be the role and societal function of education at this stage of societal development?

- What new opportunities and resources might be available for carrying out the educational function?

- What vision and what new image of education is emerging from this inquiry that might guide the design of a new system?

- What kind of approach and what strategies will enable us to realize and implement that new system?

Throughout the inquiry process for educational systems design, questions like these become the basis for exploring, defining, and describing an ideal system of education and working toward that system's development, implementation, and continuing renewal.

Clearly, these are very different questions from those we have been asking up to now. Systems design inquiry does not narrow our focus to solving specific problems. In fact, systems designers always remind themselves that getting rid of what is not wanted (the existing problems) does not ensure the attainment of what is desired.

The systems design approach moves us toward what is desired — an educational system that will address today's realities and that will be able to evolve with a changing society, exerting its own influence on and creating the future.

In Figure 1 we depict the inquiry and design process as consisting of four basic and interactive capabilities that organizations should possess. Organizations should be able to

- describe and analyze their existing system to assess its appropriateness

- design new systems representing how education ought to be conducted, given the characteristics and needs of the changing society

- develop and implement new systems

- manage the new educational system and the ongoing inquiry process

The process is depicted as circular because, as you will see, systems design does not complete itself at the conclusion of a set of linear steps. Likewise, it does not result in

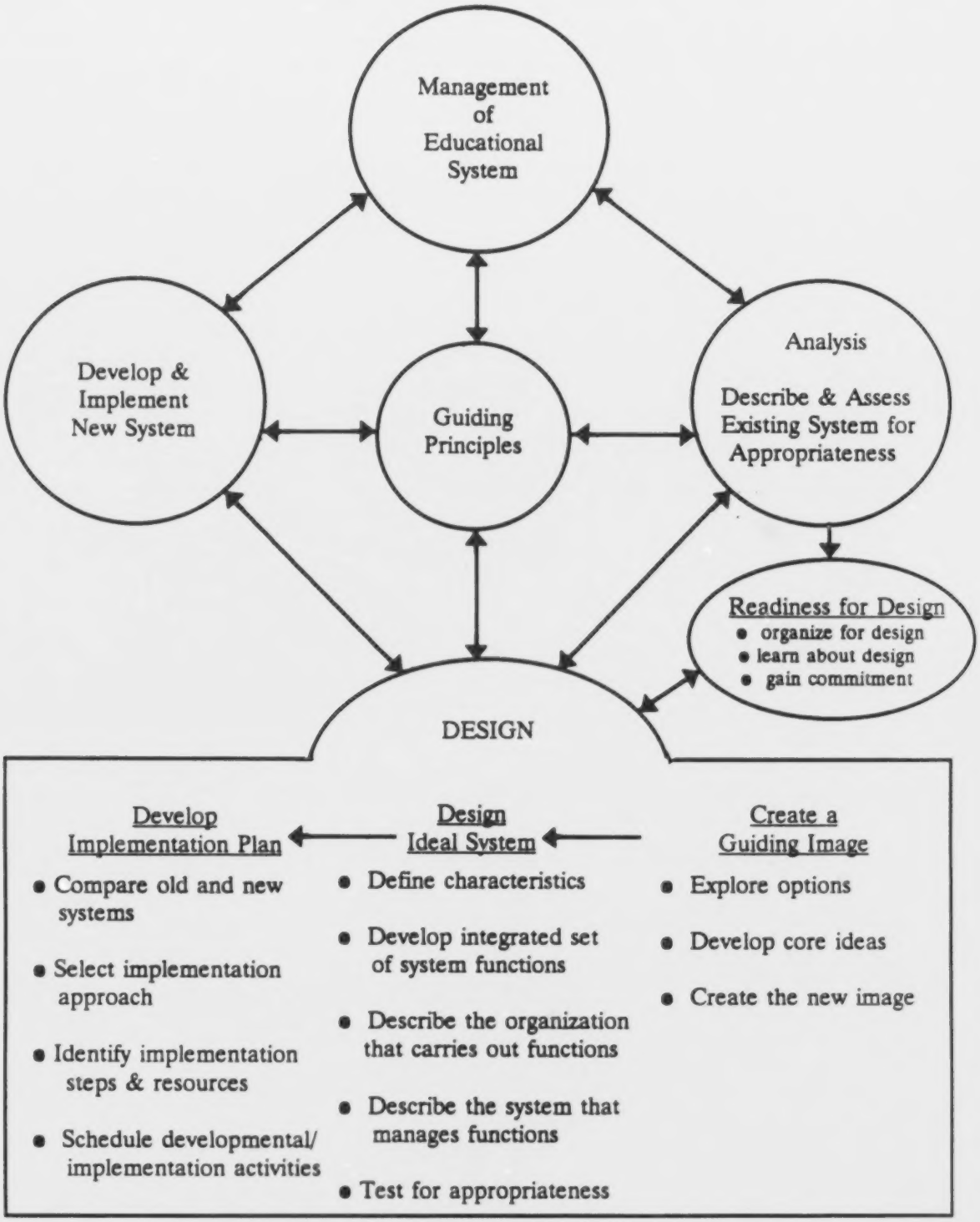
another closed system in danger of becoming insulated from the larger society. Rather, systems design is a continual process that responds to multiple feedbacks (note the arrows indicating the exchange of information associated with different stages of the process). The product of this kind of process will be a system that is also engaged in an ongoing inquiry about itself and its effectiveness for its users and the larger society.

The systems design process enables us to organize the findings of our inquiry into thorough descriptions, or models, of ideal systems of education. The focus of the process is comprehensive, resulting in change over an entire system. The design produced becomes a blueprint for guiding our implementation efforts and an ongoing source of information for making further decisions about organizational change and renewal.

In the following sections, we will move through the organizational inquiry for educational systems design.

Figure 1

ORGANIZATIONAL INQUIRY IN EDUCATION
WITH A FOCUS ON SYSTEMS DESIGN


Management of Educational System
Develop & Implement New System
Guiding Principles
Analysis
Describe & Assess Existing System for Appropriateness
Readiness for Design
• organize for design
• learn about design
• gain commitment
DESIGN
Develop Implementation Plan
• Compare old and new systems
• Select implementation approach
• Identify implementation steps & resources
• Schedule developmental/ implementation activities
Design Ideal System
• Define characteristics
• Develop integrated set of system functions
• Describe the organization that carries out functions
• Describe the system that manages functions
• Test for appropriateness
Create a Guiding Image
• Explore options
• Develop core ideas
• Create the new image

II. AT THE CENTER: SOME GUIDING PRINCIPLES

At the center of the design inquiry are guiding principles we believe are essential to a successful inquiry and design process.

Participation in Design is Inclusive. Those who participate in the design inquiry should include those who will be directly affected by or will be the users of the new system. Participation in design enables members of the organization to better understand their organization; nurtures creativity in individuals; incorporates individual and collective aspirations and values into the design; and generates consensus and commitment for the design to ensure that people will take part more effectively in the process of design and its implementation.

Design is Learning. By engaging in design we learn as individuals and as an organization. We learn to reexamine our purposes and goals and our perspectives, values, and modes of operation. We develop new knowledge and insight, which become the basis for designing our system.

Design is a Process of Realizing Ideals. The commitment to design is a commitment to creating and remaining focused on our image of the ideal system of education. That image becomes the guide for realizing the new system.

Design is Continuous. As an organization moves toward realizing its new design, the environment and situational context in which the system operates will change. Thus, the ideal system model will need constant reexamination and revision. Furthermore, the values that guide the design and shape the design may also change in response to the process.

Design is for Human Values and Human Quality. The educational organization is a system that values and serves people. Designing a just system for both present and future generations is of the highest priority. The process of giving direction to our educational future is the primary purpose of the design inquiry process.

III. ANALYZING THE EXISTING SYSTEM: USING THE SYSTEMS LENSES

By undertaking a systems analysis of the existing educational organization, we can describe our current system and come to some conclusions about its effectiveness in meeting societal and educational needs.

An effective tool for accomplishing this is the set of Systems Lenses. Each of the three lenses brings into focus characteristics associated with one of the dimensions of a system's operation and structure: (1) the systems-environment lens, (2) the functions-structure lens, and (3) the process-behavior lens. By using the three lenses together as one tool, as though overlaid one upon another, we can acquire a complete picture of either an existing system or of an emerging new system at any stage during the process of design. At the Analysis Stage, the lenses are directed on the current educational system.

(1) The **Systems-Environment Lens** focuses on the educational system in the contexts of its community and the larger society. Using this lens, we can identify the conventions that govern the systems-environment, for example, the relationships, interactions, and mutual interdependence between educational systems and social systems. By asking questions using this lens focus, we can assess the environmental adequacy of the environment's response to the educational system.

(2) The **Functions-Structure Lens** focuses our inquiry on various aspects of the system at a given moment in time. It projects a "still picture" image that enables us to describe the educational system's goals, the functions it carries out to attain those goals, the components of the system that interact to carry out those functions, and the way those components are organized and integrated to create the structure of the system.

(3) The **Process-Behavior Lens** focuses our inquiry on what the system of education does over time, giving us a "motion picture" description. It helps us understand how the system behaves as a changing, dynamic societal system: how it receives, screens, assesses, and processes information; how it transforms information and resources for use in the system; how it engages in operations to achieve its purposes; how it assesses its performance; and how it makes adjustments and changes, and, if necessary, transforms itself based on feedback from within itself and from the larger environment.

The analysis of our current system using the Systems Lenses helps us describe how the current organization functions as a system, internally and as part of the larger societal system. It also provides a basis for determining an organization's need to engage in systems design.

IV. READINESS FOR DESIGN

Preparation for educational systems design ideally involves representatives of the entire community — educators, students, and citizens who are concerned with education and its relationship to the larger society. To prepare for design, an educational community needs to

- organize for the design process
- learn about systems design
- gain community commitment to the design project

These tasks are not sequential. Organizing, gaining commitment, and learning about design are simultaneous and continuous tasks.

A. Organizing for Design

Initially, the educational community must organize itself into teams or groups for initiating the design project, educating the community and gaining its commitment, learning about and actually carrying out the design, and overseeing the design project.

Once a design project is underway, the identification of further goals and resources may require additional organization of participants and specialists. At the implementation and management stages, further organization of staff and leadership will be required as well. For the purposes of this orientation, we will address only the initial and most basic organization of participants.

The design process will be most efficient and effective if the responsibilities (and therefore the required learning) is distributed among several levels and groups.

The Design Leadership Group. The formation of a leadership group to provide overall leadership for the design process will most often be initiated and orchestrated by the school district. The leadership group will have responsibility for overseeing the process, selecting and establishing design teams, establishing review and approval procedures for the design outcomes, acquiring resources, developing and mobilizing commitment to design in the community, and in general providing a guiding and supporting voice for educational design. Because of these responsibilities, this group will want to be representative of the educational professions, the school board, students and parents, the public and private sectors, and the various community groups. They will also formulate initial guidelines and boundaries for the design process.

The Core Design Team. The core design team is the primary group that carries out the design process. Design is ideally engaged in by those who have a real stake in its

outcome and whose values will therefore be compatible with the perspectives of systems design. Core design team members should be selected for their motivation, inquiry skills, team membership skills, willingness to learn about design, and because they represent the key stakeholders concerned about education. This team will learn to use the tools and methods of educational systems design (summarized in the next section).

Design Panels. As the design process unfolds, the core design team will begin to identify design tasks requiring knowledge or subject matter expertise not available within the team. Design panels for special design tasks will be formed to provide this needed capability. Other temporary groups or task forces may also be needed to accomplish certain tasks.

B. Learning About Systems Design

Embarking on systems design requires preparation in three areas: (1) understanding of change styles; (2) developing a knowledge base for making decisions about educational systems design; and (3) learning about the process, methodology, and skills associated with systems design. (Note that not everyone involved in the design process will require the same levels of preparation.)

Attitudes Toward Change

Educational historian Maurice Gibbons has reminded us "how relentlessly the mind clings to the apparent and familiar and how perilous such blindness can be." The attitude with which we approach change in general and educational reform in particular will either contribute to genuine change and the transformation of education or will limit us to mere refinements of the present system.

Systems design requires us to consider new approaches to change, a task that can be difficult for most individuals and especially challenging for organizations, where attitudes and approaches to change tend to focus on maintaining and protecting the existing system.

Four distinctive "change styles" have been identified. No one style is usually seen in pure form, but a dominant orientation is usually present. For example, some organizations can only deal with change in the short term and actively seek to preserve the status quo by limiting their inquiry and resources to fine-tuning the existing system. Some even focus their change efforts on restoring education to a former, idealized, state (the "good old days"). These are what we have called the inactive and reactive change styles. Schools operating in these modes tend to insulate themselves, ignoring demands from the larger societal environment.

Other organizations are more progressive and exploit opportunities for change as they present themselves (preactive style). The interactive style characterizes a strong systems-design-oriented organization, in which changes are initiated, designed, and directed by members of the organization.

The many characteristics of each change style are described in Table 1. Each style has its strengths, and individual characteristics of each might be appropriate for addressing particular situations or problems in the management of an educational system. However, effective systems design relies most heavily on a change style that comes as close as possible to the interactive style described here. Ideally, an inquiring frame of mind should be directed at the entire system so that all aspects of the educational organization — its mission, purposes, structure, and operations — are continually open to question and possible redesign.

In preparing for design, it is most important that those involved examine which change styles they and their organization currently foster and whether these are adequate for undertaking design. Participants should try to remain open to the possibility of shifting to new change styles and to reexamining and reformulating their approaches to change throughout the design process.

Developing a Knowledge Base

Undertaking a systems design process for education requires the careful application of a comprehensive knowledge base, for example: educational psychology, sociology, philosophy, management and administration, pedagogy, systems philosophy and theory, organizational theory and change, and current approaches to analyzing the conditions and characteristics of our present environment. Systems inquiry draws from this content and introduces a systems approach that includes analysis, design, development, and management of educational organizations. Thus, there is a blending of a comprehensive knowledge base with a systems and design inquiry approach to produce designs for educational systems. As we gain more experience with educational systems design, our knowledge base and expertise will grow and contribute to future design efforts.

Learning the Process of Systems Design

Everyone involved with the design of a new system of education — from those who initially propose such a project to the core team and the design panels who will carry out the actual design and the many individuals and organizations within the community whose commitment and support will make the project possible — should understand the general process of systems design. This understanding includes the rationale for design, how the process is planned and conducted, and the resources that

Table 1

CHANGE STYLES

	Reactive 1	Inactive 2	Preactive 3	Interactive 4
1. Attitude toward change	restoration, "good old days"	maintenance, resist change	accelerate change, exploit opportunities	give direction to change, images
2. Arrow of time	reverse, "back to the basics"	remain in the present	look to the future, impatience	past, present, & future integrated
3. Problem & change management	simple cause & effect explanation	delayed reaction, ride it out, return to equilibrium	rely on forecasts, fear of cost-regret	focus on what might be, design a desirable future, coevolve
4. Role of science	experience is best teacher	current events provide necessary guidance	science of prediction, risk analysis, PPBS	disciplined inquiry
5. Role of technology	technology as cause of change	status quo, avoid technology unless it promises more efficiency or effectiveness	embrace technology as potential panacea	use technology as means of creating the future
6. Organization model	authoritarian	basically bureaucratic	purposive, ends - autocratic, means - democratic	system integration
7. Organization culture and values	nostalgia	preoccupation with customs, rules, & conventions	inventiveness, growth	humans as ideal seeking, not just end seeking
8. Approach to planning	top-down, perhaps ritualistic	focus on maintenance	top-down, predictive, contingency planning	planning to achieve ideal future
9. Working with problems	piecemeal	disjointed incrementism, "muddling through"	shift emerging problems to the future, postponement	identify the right set of problems
10. Attractiveness	maintains a sense of history, continuity, security	some problems fade if left alone, avoid big mistakes	progressive	best chance of coping with complexity

are needed. The core design team, because of their responsibilities for conducting design, will need advanced knowledge and skills, and the design panels should be familiar with the design process so that their expertise can be effectively applied.

C. Gaining Commitment

With the general orientation to systems design and the establishment of a design leadership group, members from all parts of the concerned community have been brought into the design project, laying the groundwork for broader community participation and commitment. As the design process proceeds, design panels and task forces of community members and school staff and students will also be brought into the project.

Most will agree that the potential power of educational systems to influence the well-being of present and future generations and empower them to shape their own future exceeds that of any other social institution. However, there is less awareness about how to create the kinds of educational systems that can coevolve with society and help create the future rather than simply react to events as they happen. Systems design offers the needed intellectual technology. Helping educational stakeholders (that includes nearly everyone) to understand and support systems design is an essential element of the process.

A basic value of systems design is that those who will be affected by a design ought to have their interests represented. Community commitment ensures not only necessary support in time, resources, and ideas, but will help create an environment in which ongoing inquiry and design can more readily be carried out.

V. DESIGNING THE NEW SYSTEM

This section outlines activities for designing the new system and its implementation plan. The work of design is carried out by the core design team, in coordination with the design leadership groups, design panels, and community task forces.

Our goal is to design an ideal system representing education at its best that will also guide us in the system's continuing change. This process involves creating and testing potential alternatives and selecting the most desirable alternative. The resulting design should be viable in the sense that it agrees with and will be able to achieve the goals and purposes that inspired it. It should be technologically feasible to implement, and it should support, in its management and organization, the process of ongoing organizational learning and, if needed, redesign.

The design phase is divided into three stages: A. Creating a Guiding Image; B. Designing the Ideal System; and C. Developing an Implementation Plan.

A. Creating a Guiding Image

1. Exploring Options: Using the Design Framework

While the Systems Lenses help us richly describe an educational system in its entirety, the Design Framework (illustrated in Figure 2) provides the dimensions for selecting a system's specific focus, boundaries, and relationships and for considering design options.

The three dimensions — **Primary Focus**, **Boundaries**, and **Relationships with Other Systems** — reflect the main dimensions of an educational system with which systems design is concerned.

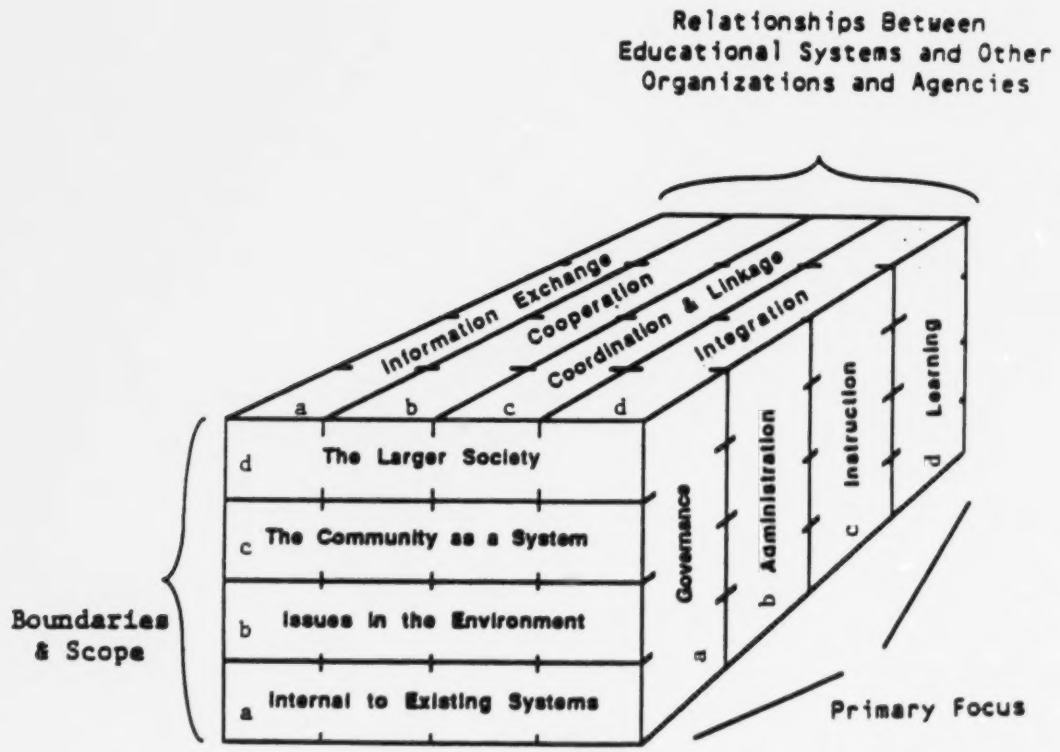
By illustrating the options within each dimension, the framework encourages us to portray the existing educational system and consider in what areas we would like to expand its boundaries and relationships or redefine its focus. Our choices set the initial parameters of the design process and, ultimately, of the new system.

Primary Focus

Focus tells us what people and what related activities and goals are given the most power and priority in an educational system. In considering the four options of this dimension, we might also ask what values are associated with each focus and how well a system with that focus fills our educational and societal needs.

Figure 2

Design Framework: Exploring Options in Educational Systems Design



a. *Governance* is in focus when the purpose of education is defined as indoctrination and acculturation. Top decision makers determine policies and mandate curriculum and instruction.

b. *Administration* is most commonly the focus in today's public schools. In the usual arrangement, administration defines the instructional content and sometimes even methods. Governance sets policies and secures resources.

c. When the *Instructional Level* is in focus, administration and governance provide policies and resources for its support. The instructional system defines the content and method of instruction, and students are asked to respond to it. Some recent restructuring efforts have proposed a realignment of instructional leadership by shifting instructional authority to the school level.

d. With a focus on the *Learning Experience*, students are the center of the educational system, and the system's main function becomes the facilitation of learning. Components of the educational system (teaching-learning arrangements, learning research and environments, etc.) interact to support the goal of learning. Such a focus is rarely found today.

Boundaries

Boundaries indicate to what extent the educational system includes the larger community and societal environment. Our choice of boundaries also defines the scope of our design inquiry.

a. Design that is limited to the *Existing System* is typical of current improvement programs. These usually involve attempts to solve specific problems related to management, instructional effectiveness, staff development, etc.

b. By broadening our attention to include *Issues in the Environment*, the design inquiry may consider problems that cross over the boundary between the school and the community, for example, drug abuse, teen pregnancy, students at risk. But the scope of the inquiry remains mostly within the boundaries of the existing school or district organization.

c. When our boundaries are extended to include the *Community*, other societal systems, organizations, and agencies might be involved in providing resources and arrangements for learning. Examples include internships, projects using community resources, field trips, and other experiential learning arrangements.

d. The broadest boundary considers educational systems in relation to the *Larger Society*. With this perspective, educational systems not only respond to the problems, challenges, requirements, and goals of our rapidly changing society, but take an active

role in shaping societal development. Some possibilities might include community volunteerism, global education issues, cross-cultural learning, constant exploration of larger societal issues, and other examples not yet dreamed of.

Relationships With other Systems

This dimension has to do with relationships between educational systems and other systems and organizations within the larger environment, the content of their interactions, and the values and responsibilities associated with their arrangement.

a. *Information Exchange* is the most frequent pattern seen today. It involves simply informing the community about the schools and gathering information about the community for use in the schools.

b. *Cooperation* involves interaction between schools and outside institutions in order to meet complementary goals or share resources. For example, community-sponsored school events to keep kids off the streets or joint projects between community agencies and the schools is to help the poor. Cooperating agencies remain autonomous.

c. *Coordination* involves formally linking the educational system with other institutions to accomplish mutual goals of education and human development. For example, a school district and social services of a community might together create a program to provide childcare and parent education to the community. With coordination, "ownership" of a particular enterprise (its resources, responsibilities, authority, etc.) is shared by all those involved.

d. Through *Integration*, what we now call school would become a component of a communitywide system for learning and human development. With the integration of systems in the public and private sectors (community organizations and various other agencies), optimal use of varied resources is possible. Integration is the most intensive and highest level of interorganizational relationship. There are no examples yet of this sophisticated concept in action, but we expect examples to emerge through the design work of school districts and communities.

The choice of one focus or boundary will most likely influence our choice of options in the other dimensions. For example, if the focus of the system is the learner, boundaries and relationships with other systems will probably be defined to acquire resources and accomplish goals related to learner-focused education.

The use of the framework dramatizes differences between current approaches to education, which are generally limited to options a and b, and the systems design approach to fundamental change, which emphasizes boundaries c and d (for example, the most progressive design would select options primary focus-learner, boundaries-society, and relationships-integrated).

But choices cannot be prescribed for all communities and all school districts. The unique "ecology" of a specific community must be considered by those who would design a new educational system within that context. Thus, choice of options and means will be open to each design community. However, we do urge you to aim as much as possible for at least the community level as your boundary, cooperation-coordination for relationship to other systems, and, most important, to place the learning level in focus.

As you can see, the Design Framework is much more than an analytical tool. It encourages us to jump beyond the boundaries of existing systems to consider new options and even envision new systems of education. In the process, we begin to generate new ideas for ourselves about education.

2. Developing Core Ideas

Core ideas are statements about what we have come to believe regarding the appropriate role of education in our society, the nature of learners, learning, and human development, and how the learning environment affects learning. Core ideas emerge from our own values, aspirations, and perspectives, our general knowledge base, societal conceptions, and from our answers to questions we pose in the process of the design inquiry.

The previous step of determining system and design parameters brought us closer to establishing our core ideas by helping us identify our focus and the values associated with that focus.

For example, given the choices of learner as focus, the community as educational system, and coordination with other agencies and organizations in the community to design and operate components of the new educational system, our core idea statements might include:

- Education should be focused on the learner and the development of his or her full potential as an individual and as a participant in society.
- Education should provide resources and opportunities for lifelong learning and development for all individuals.
- Education should operate as a fully integrated component of a larger system for human development and learning, in a cooperative-coordinated relationship, rather than as the autonomous and isolated system it is currently.
- Education should take into account all those domains that are part of human development.

Together, the boundary choices and core ideas clarify our concerns and purpose and lead us to an initial image of an ideal system of education.

3. Creating a New Image

Images are powerful. Just as old images can impede our ability to initiate change, new images can pull us toward a new future.

Our new image of educational systems will answer such questions as: What are our aspirations for and expectations of the system? What is the system's goal in serving humanity and the larger society, the community and learners? What is our shared vision about the societal function of education?

Given the example of choices and core ideas above, our new image might describe a system of education that

- is designed around the learner (content, learning experience, and resources are selected with this focus in mind)
- includes a variety of learning approaches (for example, self-directed, technology-based, cooperative team learning) and remains open to considering new approaches
- uses the large reservoir of resources and expertise offered by the community and society
- takes its content from all domains of human experience (including the ethical, spiritual, occupational, technological, aesthetic, etc.) and remains open to others
- provides opportunities for lifelong learning and development for all members of the community
- involves an integration with other social systems to provide resources and environments for learning and for human development (social service systems, private and public agencies, etc.)

Mission Statement

The image can be a source for formulating a mission statement that will endow everyone in the educational system and the community with a common purpose and provide guidance for the design inquiry process. Statement of a mission should tell us

what the system is going to do for learners, the community, and the larger environment, including other systems, and how it sees itself as a system.

B. Designing the Ideal System

With the image of our ideal system as a guide and the mission statement defined, the next step is to design the ideal system — its characteristics, functions, management, and implementing organization. In other words, we are on our way from envisioning an image — the core ideas and options — to designing and describing a model of the new system that will serve as the actual blueprint for introducing change.

1. Define System Characteristics

System characteristics are the requirements of the system. They answer such questions as: Who are the key clients of the system? What services will be offered and by whom? What are the system's responsibilities to its clients, the community, and society, and how will these be carried out?

Characteristics for the ideal system described above by our image might include all members of the community and cognitive and social development, childcare, programs for the elderly, career development, parenting education, counseling, cross-cultural education, etc., as clients.

Characteristics are formulated with the ideal in mind and are checked against the image of what the new system should be. They are described in enough detail to help us determine what functions we will next need to design.

2. Identify System Functions

System functions describe the actions that will be performed so that the system can deliver services to its clients. Basic and ongoing system functions include developing educational requirements and standards for identified clients; defining the learning necessary to meet those requirements; identifying resources for learning; acquiring and organizing those resources; and delivering or providing learning opportunities to learners.

For example, designers might decide that requirements include cross-cultural education and an understanding of global interdependence. Learning related to this requirement might be defined as understanding acceptable behavior in cross-cultural settings and cultural knowledge and appreciation. Learning resources might include community groups, ethnic organizations, museums, readings, etc.

System functions must be organized so that they are complementary and integrated. System functions are always open to reevaluation with regards to their effectiveness in achieving the system's goals and meeting the expectations of clients, even as these needs and expectations change.

The ongoing design of system characteristics and functions will become a management task in the new educational system. Carrying out system functions is the task of the organization.

3. Describe the New Organization

The system of characteristics and functions constitutes the work of the new system that will be performed for designated clients. To the extent that the new system's functions are different from those of the present system, the existing educational organization (the district office, the schools, self-contained classrooms, etc.) may no longer be appropriate.

The basic questions to ask include: Given the clients to be served, the set of functions to be performed, and the services to be provided, what component parts will have the capability to carry out those functions and services? What kind of organization is needed? What new competencies will staff need to work effectively in the new system? How will the staff and community participants and resources be organized to provide the needed learning? What authority assignments and resource allocation procedures are called for?

4. Describe the Management System

How will the educational organization that has been designed be guided and monitored to ensure that the functions and services are being carried out? A management system must be able to: identify actual and potential operating problems: develop and implement changes; provide motivation and incentives for performance; and ensure the continuous supply of information to assess performance and inform decision makers. The ongoing design of characteristics and functions becomes part of managing the new system.

C. Developing an Implementation Plan

Now that the new system has been designed, the final design activity is to develop an implementation plan. At this stage of the process, feasibility comes into play. Preferably, designers will resist diminishing the new image or the intention of realizing the ultimate goal of putting a new educational system into place. Instead, we ask how

much of the new design it is feasible to introduce, how quickly it can be accomplished, and what activities will be necessary to bring about its implementation.

A first step is to turn again to the Systems Lenses we used to analyze the existing system. A description of the new design is prepared using the three primary dimensions of environment, functions/structure, and processes. By comparing this description of the new system with our description of the existing system, we can see discrepancies between what is and what should be. Using the lenses makes it possible to juxtapose the two system descriptions in terms of their basic characteristics and identify the changes that are needed to move from the old to the new.

These changes will translate into activities. For example, a new design might call for preschool child care, parent support and training, new staff roles, new teaching and learning practices, new grouping arrangements, new staffing structures, more extensive use of community resources and expertise for instruction, different decision-making processes, new linkages between the district and community agencies, or greater emphasis on continuous assessment. Changes such as these will require development time, resources, staff training, etc. The transition from an existing system to a new or substantially different one will probably be done in phases. Or it might be approached as a pilot experiment using a small-scale version of the design.

Identifying, describing, scheduling, and assigning responsibilities for the myriad of needed activities to facilitate implementation becomes the plan that guides the implementation process.

VI. DEVELOPING AND IMPLEMENTING THE NEW SYSTEM

The schedule of activities and responsibilities prepared during the final stage of design provides the basis for proceeding. As activities are completed, the staff develops new skills, resources are acquired, and new relationships and links are forged. The organization's general readiness to implement and operate the new system is increased.

Implementation can be approached by phasing in components of the new design. Key changes are made gradually to minimize problems and maximize "small wins," encouraging staff confidence and success.

Implementation can also be approached as a pilot experiment. A small-scale version of the design is developed and tried out without disturbing the rest of the system. This approach permits implementers to learn more about possible implementation problems inherent in the design. Difficulties encountered during a pilot experiment can be more easily handled and adjustments in the design more readily made.

With either implementation approach, the primary risks are the tendency to reshape new practices to be more like old, familiar ones and the tendency to make premature judgments about the new system before it is fully in place.

VII. MANAGEMENT

It is important to remember that design is a continuous process and that the new system will be continually reexamined. Inquiry and revision will continue, even as the new system is being phased in, and afterwards, as part of its continuing development.

As the new system is phased in, feedback from users and responses in the larger environment (including changes in the existing system) will influence the ongoing process of design and redesign. The now-familiar Systems Lenses will be a valuable tool for management. Using the lenses to describe the educational system at any point in time can help us identify any discrepancies between our intentions and the emerging reality.

This is the primary challenge of managing systems design: that the process be ongoing and that those involved remain committed and open to change so that the new system does not become rigidly set in place but continues to evolve with the needs and goals of its users and the larger society.

Questions to ask include: How can the organization, through its structures, processes, and interactions, develop the capacity to engage in inquiry about itself? How can the organization learn how to learn? In other words, how can the organization learn to use feedback to help correct deficiencies in its performance and to know when the existing system is no longer compatible with the needs and conditions of the environment it serves and should be redesigned? In summary, how can the organization learn to sustain a comprehensive system design process?

Inclusion and collaboration are key elements in organizational learning. The systems design approach is best supported by developing staff knowledge and design skills across the organization, and by drawing on and encouraging a variety of perspectives. Interactions among staff concerning organizational issues can be a primary mechanism for gathering information, creating alternatives, initiating innovative efforts, responding to opportunities, and making decisions.

Ideally, the management of an organization ensures the capability and capacity to respond systemically and creatively to change by maintaining a learning environment within the organization. By distributing responsibility and accountability and involving all its members in organizationwide issues, a systems point of view is maintained and shared perspective and purpose is strengthened.

CONCLUSION

Through this orientation, you have been invited to view education in a new way, from the perspective of systems design. You have:

- explored the implications for education of our rapidly changing society
- become familiar with systems design as a process for creating a new, more effective system of education
- assessed the possible benefits of systems design for your community and schools
- developed a basic understanding of the requirements for conducting a systems design inquiry

A community engaged in educational systems design is empowered to help shape its own future as learners.

The next step is to develop leadership for the systems design undertaking. The second document in this series, The Transformation of Education By Design: A Leadership Guide for Educational Decision Makers, will enable a leadership group to learn about their critical role in a systems design effort and to establish general guidelines for that effort.